

Application No. 09/511,943
Attorney Docket No 2000B009
Amendment Dated October 9, 2003
Reply to Office Action of June 25, 2003

REMARKS

Reconsideration of the above-identified application in view of the following remarks is respectfully requested. Claims 1-16 are now pending for the Examiner's consideration. For the reasons that follow, Applicants believe all claims are in condition for allowance. Applicants acknowledge with appreciation the withdrawal of the rejections raised in the previous Office Action.

Rejection of Claims 1-16

Claims 1-16 have been rejected under 35 USC 103 as being unpatentable over U.S. Patent No. 6,051,746 (Sun). Applicants respectfully traverse this rejection.

Claim 1 covers a crystalline silicoaluminophosphate molecular sieve. The silicoaluminophosphate molecular sieve comprises an eight-member ring porous framework structure and a catalytically active integrated aromatic hydrocarbon co-catalyst within the eight-member ring porous framework structure. The silicoaluminophosphate molecular sieve has a catalytic activity index for methanol conversion at 250°C of at least 2. Claims 2-8 depend from claim 1 and contain all of the elements of claim 1.

Claim 9 sets forth a catalyst for converting an oxygenate feedstock to an olefin product. The catalyst comprising a crystalline silicoaluminophosphate molecular sieve having an eight-member ring porous framework structure, and a binder. The porous framework structure contains an active integrated aromatic hydrocarbon co-catalyst within the eight-member ring porous framework structure. The silicoaluminophosphate molecular sieve has a catalytic activity index for methanol conversion at 250°C of at least 2. Claims 10-16 depend from claim 9 and contain all of the elements of claim 9.

Both claims 1 and 9 teach or include a silicoaluminophosphate molecular sieve catalyst having an eight member ring porous framework structure that contains an active

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integrated hydrocarbon co-catalyst within the eight-member ring porous framework structure.

In contrast, Sun teaches a modified small pore molecular sieve catalyst that has improved selectivity by exposing the catalyst to a modifier. Sun at col. 2, lines 9-21. The modifier is a polynuclear aromatic heterocyclic compound with at least three interconnecting ring structures. *Id.* However, Sun does not teach the forming of an integrated hydrocarbon co-catalyst within the porous framework structure. It would be impossible to form the integrated hydrocarbon co-catalyst within the porous structure when the modifier is larger than the pore size. See Vaughn Decl @ par. 5.

A polynuclear aromatic heterocyclic compound with at least three interconnecting ring structures cannot penetrate the pores of a small pore molecular sieve catalyst which is defined as a catalyst that has a pore size of less than about 5.0 Angstroms. As previously established, even the smallest single ring aromatic has an effective diameter greater than 5.0. Because the heterocyclic compound cannot penetrate into the pores, it cannot form an integrated hydrocarbon co-catalyst within the porous framework structure. See Vaughn Decl @ par 6. These facts are also supported by statements in Sun. "The modifiers of the present invention may be adsorbed onto the catalyst either prior to or simultaneous with the introduction of the oxygenate feed." Sun at column 3, lines 53-55.

Additionally, the use of the present inventions set forth in claims 1 and 9 have an unexpected result over Sun. Examples 1 and 2 teach the benefit of practicing the present invention over the prior art. Different samples of a selected SAPO sieve were pretreated by exposing the SAPO sieve with different hydrocarbon compounds including acetone in vacuo at 200°C for 1 hour. Results indicated that 1-3 wt.% hydrocarbon co-catalyst is contained within the pores. Example 2 describes the conversion of various catalyst samples including untreated SAPO sieve and SAPO sieve pretreated with acetone as described above. The data from this experiment is shown in Figure 5.

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A silicoaluminophosphate molecular sieve having a porous framework structure is contacted with a hydrocarbon (i.e. acetone) at conditions effective (eg. 200C in vacuo for 1 hour) to form at least an integrated hydrocarbon co-catalyst within the porous framework. Next, the silicoaluminophosphate molecular sieve containing the integrated hydrocarbon co-catalyst is contacted with an oxygenate feedstock under conditions effective to convert the feedstock to the olefin product. The pretreated samples were compared against samples that were not pretreated (i.e. as taught in accordance with prior art.

The samples that follow the teaching of the present invention, by pretreatment with acetone, had an ethylene selectivity that was about 10 wt.% greater than the sample that was not pretreated at all reaction times shown. The modified catalyst disclosed in Sun exhibited an increase of approximately 3% in ethylene yield and decrease in propylene yield. The difference in ethylene yield increase observed in Sun and observed by the present invention is significant. The present invention has a much more favorable increase in ethylene yield, which increase represents an unexpected result. Accordingly, the present invention is not obvious over Sun. Withdrawal of this rejection is respectfully requested.

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Applicants invite the Examiner to telephone the undersigned attorney if there are any issues outstanding which have not been presented to the Examiner's satisfaction.

10/9/2003
Date

Respectfully submitted,

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